Clean Copy of Claims 44-67

44. (Amended) A method as claimed in claim 46, wherein the saturable absorption grating is provided at one end of the signal amplification region and is in the form of a planar waveguide.

45. (New) A method of reducing power fluctuations in the output of a distributed feedback laser structure, the method comprising the steps of:

- generating a first laser optical output utilizing distributed feedback,

- amplifying the first laser output, and

- inducing a saturable absorption grating in the optical path of the first laser output utilizing a portion of the amplified first laser output, and

- utilizing phase-discriminating properties of the induced saturable absorption grating to reduce fluctuation in the output of the distributed feedback laser structure.

46. (New) A method as claimed in claim 45, wherein the saturable absorption grating is induced in the optical path of the first laser output at one end of a signal amplification region of the distributed feedback laser structure.

47. (New) A method as claimed in claim 45, wherein the saturable absorption grating is induced in the optical path of the first laser output in a signal amplification region of the distributed feedback laser structure.

48. (New) A method as claimed in claim 45, wherein the step of inducing the saturable absorption grating comprises coupling the portion of the amplified first laser output back into the distributed feedback laser structure.

49. (New) A method as claimed in claim 45, wherein the distributed feedback laser structure comprises erbium doped fiber.

50. (New) A method as claimed in claim 45, wherein the portion of the amplified first laser output provides a phase-conjugated feedback signal for the generating of the first laser optical output utilizing the distributed feedback.

51. (New) A method as claimed in claim 45, wherein the portion of the amplified first laser output provides resonant pumping as well as saturates gain in a distributed–feedback region of the distributed feedback laser structure to a threshold value.

52. (New) A method as claimed in claim 45, wherein the method comprises the step of generating the first laser optical output utilizing a plurality of distributed feedback regions connected in series.

53. (New) A method as claimed in claim 52, wherein one saturable absorption region for inducing the saturable absorption grating and one feedback loop for utilizing the portion of the amplified first laser output are shared between the plurality of distributed feedback regions.

54. (New) A method as claimed in claim 45, wherein the step of generating the first laser output comprises utilizing a distributed feedback region of the distributed feedback laser structure comprising a Bragg grating structure.

55. (New) A method as claimed in claim 54, wherein the Bragg grating structure comprises one or more of a group comprising a chirped Bragg grating, a sampled Bragg grating, a phase-shifted Bragg grating, and an apodised Bragg grating.

56. (New) A method as claimed in claim 45, wherein the distributed feedback laser structure comprises a planar waveguide structure.

57. (New) A distributed feedback laser structure comprising:

- a distributed feedback element for generating a first laser optical output,

- a signal amplification element for amplifying the first laser output from the distributed feedback structure,

- a saturable absorption element, and

- an optical feedback element arranged, in use, to direct a portion of the amplified first laser output to the saturable absorption element in a manner such that a saturable absorption grating is induced in the saturable absorption element, whereby phase-discriminating properties of the induced saturable absorption grating are utilized, in use, to reduce power fluctuation in the output of the distributed feedback laser structure.

58. (New) A distributed feedback laser structure as claimed in claim 57, wherein the saturable absorption element is provided at one end of the signal amplification element.

59. (New) A distributed feedback laser structure as claimed in claim 57, wherein the saturable absorption element forms part of the signal amplification element.

60. (New) A distributed feedback laser structure as claimed in claim 57, wherein one or more of a group comprising the distributed feedback element, the signal amplification element, and the saturable absorption element are formed from erbium doped fiber.

61. (New) A distributed feedback laser structure as claimed in claim 57, wherein the distributed feedback laser structure is arranged, in use, in a manner such that the portion of the amplified first laser output provides a phase-conjugated feedback signal to the output of the distributed feedback element.

62. (New) A laser structure as claimed in claim 57, wherein the distributed feedback laser structure is arranged in a manner such that, in use, the portion of the amplified first laser

output provides resonant pumping as well as saturates gain in the distributed feedback element to a threshold value.

63. (New) A distributed laser structure as claimed in claim 57, wherein the distributed feedback element comprises a plurality of distributed feedback regions connected in series.

64. (New) A distributed feedback laser structure as claimed in claim 63, wherein one signal amplification element and one saturable absorption element and one optical feedback element are shared between the plurality of distributed feedback regions.

65. (New) A distributed feedback laser structure as claimed in claim 57, wherein the distributed feedback element comprises a Bragg grating structure.

66. (New) A distributed feedback laser structure as claimed in claim 65, wherein the Bragg grating structure comprises one or more of a group comprising a chirped Bragg grating, a sampled Bragg grating, a phase-shifted Bragg grating, and an apodised Bragg grating.

67. (New) A distributed feedback laser structure as claimed in claim 57, comprising a planar waveguide structure.

68. (New) A distributed feedback laser structure as claimed in claim 67, wherein one or more of a group comprising the distributed feedback element, the signal amplification element, and the saturable absorption element and the optical feedback element are in the form of planar waveguides.